



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/802,746	03/18/2004	Cynthia W. Berry	1215-0508P (000552-078)	5357
2292	7590	03/06/2006	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			NGUYEN, DONGHAI D	
			ART UNIT	PAPER NUMBER
			3729	
DATE MAILED: 03/06/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/802,746	BERRY ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Donghai D. Nguyen	3729	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 July 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 1-13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 14-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

**DETAILED ACTION**

***Election/Restrictions***

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-3, drawn to a method for forming multilayered base, classified in class 29, subclass 825.
  - II. Claims 4-13, drawn to another method for forming multilayered base, classified in class 29, subclass 831.
  - III. Claims 14-22, drawn to another method for forming multilayered base, classified in class 29, subclass 846.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I, II and III are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct if they do not overlap in scope and are not obvious variants, and if it is shown that at least one subcombination is separately usable. In the instant case, the subcombination invention of Group I has separate utility such as by simply applying metal layers on surfaces of the module; the subcombination invention of Group II has separate utility such as by applying one or more intermediate metal layers on the adhesion layer of the module surface; and, the subcombination invention of Group III has separate utility by itself i.e., screening on at least a metal layer and drying it on a surface of the module. See MPEP § 806.05(d).

3. Because these inventions are independent or distinct for the reasons given above and have acquired a separate status in the art in view of their different classification, the inventions require a different field of search (see MPEP § 808.02), and have acquired a separate status in

the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with William L. Gates on February 23, 2006 a provisional election was made with traverse to prosecute the invention of Group III, claims 14-22. Affirmation of this election must be made by applicants in replying to this Office action. Claims 1-13 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicants are reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

7. Claims 14-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The following are examples:

a) "said base" (claim 14, line 7) lacks proper antecedent basis.

b) is “a first predetermined pattern” (claim 14, line 6) is as same as that previously cited in line 2 of claim 2?

c) It’s not clear as to how the “screening” (claim 14, line 11) can be done on at least one metal layers when they’re in form of plurality layers.

d) “said metal layer” (claim 14, line 11) lacks proper antecedent basis. It appears that “said metal layer” is “the first top metal layer” of line 5, etc., please clarify?

e) “if further bases are to be applied, firing said module at said second temperature” (claims 14 and 15, lines 16-17 and claim 16, lines 17-18) is conditioning statement which does not further limit the claimed method.

f) “said first surface (claim 14, line 18) lacks antecedent basis.

g) Whether “a second base” (claim 15, line 18) and “a third base” (claim 16, line 21) as same as “a second said base” (claim 15, line 3) and “a third said base” (claim 16, line 4). Please clarify.

h) “it” (claim 14, line 11, etc.,) should be spelled out as “metal layer”. The phrase “at a said” (claim 19, line 3) should be: --at an--.

### ***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 14, 15, 17, 18, 20 and 20 as best understood are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 5,847,326 to Kawakami et al in view of US Patent 6,041,496 to Haq et al.

Regarding claim 14, Kawakami et al disclose a method for forming at least a first multilayered base having a first predetermined pattern on at least one surface of a multi-surfaced LTCC module (11) which has a stack of ceramic layers (12) fired at a first, cofired temperature (See Col. 4, lines 23-25), comprising the steps of: applying a plurality of metal layers (16/17), including a first top metal layer, in a first predetermined pattern to build up the thickness of said base (See Fig. 1), and firing said module after application of predetermined ones of said metal layers at a second temperature lower than said first, cofired temperature, but of a value to partially sinter said metal layers (Col. 4, lines 29-32); and which includes the step of screening on at least one said metal layer and allowing it to dry and then applying a subsequent metal layer, prior to said firing (Col. 4, lines 26-29); and if further bases are to be applied, firing said module at said second temperature to partially sinter said first top metal layer (See Fig. 2); said layers on said first surface forming a first base for receiving a first predetermined component (18).

However Kawakami et al do not teach firing said module at an elevated temperature greater than said second temperature. Haq et al teach the step of final firing the module at temperature (850° C, see Col. 19, line 56) greater than the second temperature (e.g., about 800° C, see Col. 18, line 45) to impart optimum characteristics the metal layers (see. Col. 20, lines 1-3). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Kawakami's method to have the module being fired at the temperature greater

than said second temperature for to impart optimum characteristics the metal layers screen printed on the surface of the module.

Regarding claim 15, Haq et al disclose the forming a second base on a second said surface (bottom surface) of said module (See Fig. 1)

Limitations of claims 17-18 are also met by the combine teachings set forth above.

Regarding claims 20 and 21, Haq/Kawakami et al do not teach the step of applying a frame member as said first component to said first base and a heat sink member as said second component to said second base. It would have obvious matter of design choice to apply either frame member of heat sink or the likes on a first or second bases. Since applicants have not stated that the using of frame and/or heat sink on the assembly would solve any stated problem or is for any particular purpose and it appears that the invention would perform equally well with the teaching of Haq/Kawakami et al. Note that US Patent 6,271,579 to Going et al teach the attaching a frame 110 and heat sink 102 to the LTCC assembly as an extrinsic evidence.

#### ***Allowable Subject Matter***

10. Claims 16, 19 and 22 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

#### ***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art references cited for their teaching of making a LTCC module.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donghai D. Nguyen whose telephone number is (571)-272-4566. The examiner can normally be reached on Monday-Friday (9:00-6:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter D. Vo can be reached on (571)-272-4690. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DN  
February 27, 2006

  
**MINH TRINH**  
**PRIMARY EXAMINER**